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FORESTRY WORK FOR UNEMPLOYMENT RELIEF

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The public forests present an excellent opportunity for the employment of men on desirable activities which will either increase the intrinsic value of these forests or build up their usefulness to the people. The forests serve not only for the production of timber for future use of industries, but also for the protection of watersheds against erosion, for the regulation of stream flow, and for public outdoor recreation in all its forms, including camping, hiking, hunting, fishing, and nature study. The value of the forest for all these purposes may be increased by the judicious use of labor. Watershed and streamflow conditions may be improved by reforestation, or by the construction of check dams and other stream improvements. Habitat conditions for the principal game fish in the streams may also be improved by modifying the channels, constructing breeding and resting pools, etc. The possibilities of improving conditions for game animals and birds by controlling or modifying the character and composition of the forest cover or by introducing and encouraging certain food plants have not been thoroughly explored. But the requirements of a few species are sufficiently well known to justify some constructive measures.

To increase the use of the forest for public recreation, much can be done in the construction of woods, roads and trails, development and improvement of camp grounds, construction of fireplaces, etc.

To reduce the danger from fire and so protect the forests for all uses, much desirable work might be done, in opening up old roads, developing water holes as pumping stations, clearing fire lines, disposal of slash and other debris along roadsides, etc.

Finally, to increase the intrinsic value of the forest for timber production, a large amount of work along a number of lines may be undertaken. The public has little appreciation of what these operations consist, and of what the results are likely to be, yet there is a growing realization of the need for more intensive and constructive handling of the woodlands for timber production. This statement of the principal lines of work, other than planting, and of the possible benefits from such work as illustrated by specific cases, may therefore serve to stimulate the use of unemployment relief for the scientific improvement of the public forests for future timber production. This statement has been prepared at the request of the Northeastern Forest Research Council, a board appointed by the Secretary of Agriculture to advise the Northeastern Forest Experiment Station and to coordinate and stimulate forest research by all agencies in

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the Northeast. The object of this statement is simply to show in a specific manner the desirability of an increased use of labor, especially justified at this time, to build up larger timber values for the future. It does not consider work to increase or improve the other services of the forest as outlined above.

Thinnings

The residual stand following a thinning operation is made up of the more valuable and desirable trees which as a result of improved growing conditions are in a position to make accelerated height and diameter growth. The material removed in making thinnings and other intermediate cutting operations has in most cases a limited market as fuelwood. The disposal of this material resulting from extensive thinning operations would at this time further glut the market, largely wiping out the profits of other fuelwood operators in the same locality. For this reason this type of work if undertaken for unemployment relief should aim primarily at the improvement of the stand rather than attempt to receive immediate cash returns.

On the Yale Forest at Keene, New Hampshire, a stand of pine was improved by a thinning, at the same time showing an average net return of $43.90 per acre for stumpage.[1] Sample areas indicate that the ultimate yield on areas thinned will be more than twice that on unthinned areas. Half of this difference in yield will result from the utilization of material that would otherwise be wasted, and the remainder the result of accelerated growth of the residual trees.

In the sprout hardwood forests of New York, intermediate and reproduction cuttings reduced by about 40 years the period required to attain merchantable diameters of the better hardwoods.[2]

Thinning operations, unless the material cut has an immediate market value, should be limited to overcrowded stands in which the residual stand would have a relatively high value. If none of the material cut is removed from the area thinned, the fire hazard, particularly in softwood stands, is increased, a very important consideration on areas having a high fire risk.

Cleanings or Weedings

Cleaning operations, that is, the removal of trees of undesirable form or species from a stand not yet past the sapling stage, have, when properly applied, a more beneficial effect on the make-up of a stand than any other silvicultural treatment. The treatment is one that requires the supervision or at least the advice of someone having considerable knowledge of growing timber crops in order to avoid unnecessary expense and to realize the greatest possible returns.

1 Toumey, J. W. The Yale Demonstration and Research Forest. Yale University School of Forestry, Bulletin No. 33. 1932.

2 Spaeth, J. Nelson. Twenty Years' Growth of a Sprout Hardwood Forest of New York. Cornell Univ. Agr. Exp. Sta. Bulletin 435. March, 1928.

1930

1920

1915

1911

TREATED

WEEDED IN 1905 & 1915

UNTREATED

DEVELOPMENT OF A PINE UNDERSTORY WITH AND WITHOUT A WEEDING OPERATION

PETERBORO, NEW HAMPSHIRE

PLATE I

Experimental work on the Harvard Forest at Petersham, Mass., indicates that the removal of the gray birch from a white pine stand at the proper time would make certain a yield of at least 30,000 board feet of pine per acre at the end of a 60 year rotation.[1] If no such cutting were made, an acre might at best produce 3 crops or a total of 54 cords of poor quality fuelwood at the same time.

In 1906 the United States Forest Service established a pair of sample plots on an old field at Peterboro, New Hampshire. Both plots supported a good stand of white and Norway pine 3 to 6 years old, overtopped by a sapling stand of hardwoods, principally gray and paper birch. When established four and one-half hours per acre were spent disengaging the pine on one plot; the other plot remained intact for comparison. The treated plot was treated again in 1915.

In 1930 the check plot supported a larger number of stems per acre in spite of which the total volume of the pine was less than half that of the treated plot. At this time, 24 years after the cleaning operation, the pine on the treated area was healthier, of better form, and in every way superior. On the treated plot the average tree had a D.B.H. of 3.8 inches and a total height of 28 feet, while on the check area the average tree had a D.B.H. of only 2.3 inches and a total height of only 9 feet. The treated plot will produce a good stand of saw timber while the stand on the check plot has very little present or potential value except as poor quality fuelwood. (See Plate 1).

Before weeding operations are undertaken, the stand on the area to be treated should be carefully examined. If a sufficient number of trees of the more valuable species are making satisfactory development with little likelihood of suppression, a cleaning operation would be unnecessary. But in mixed growth there may be a scarcity of trees of valuable species and good form to make up a full stand. Cutting should be planned to release the desirable trees but should be avoided where such trees are lacking. Only enough work should be done to free the valuable trees from suppression and crowding. In this way the expense will be kept at a minimum, more or less proportional to the number of valuable trees per acre, and yet all desirable elements in the young stand will be maintained.

Best results will of course be obtained where there are a sufficient number of valuable trees to make up a well stocked residual stand after treatment.

Pruning

The pruning of white pine and possibly other conifers is, if properly carried out, a profitable undertaking. It is the only means of producing clear lumber on a short rotation and for this reason should be carefully considered in making plans for the management of young stands of timber.

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1 Spaeth, J. Nelson. Notes on Release of White Pine in Harvard Forest. Journal of Forestry, XX:2, February, 1932.

Many pruning operations have in the past been unsuccessful as the trees for treatment were poorly selected and the wrong methods used in pruning. In some cases, stands suffered rather than benefited from the operation.

In a few cases a comparatively good showing has been made where a careful job of pruning was undertaken solely as a commercial venture. In the Northeast the outstanding example of such an operation is the work of Mr. O. M. Pratt, of Holderness, New Hampshire. [1] Although it is impossible to forsee the value of lumber 30 or 40 years hence, Mr. Pratt's work has and probably will continue to yield a profit in addition to a return of 6 per cent compound interest on the investments in pruning operations.

As a result of the weevil damage, many of the white pine plantations in New York and New England now have little or no prospective commercial value.

Experimental work on the Harvard Forest would indicate that in the average badly weeviled stand the crop trees might be pruned at a cost of $10 to $13 per acre and the undesirable trees girdled at a cost of $4 to $8 per acre. [2] As a result of these operations, the stands will be made up of only the straightest and best shaped trees pruned to produce high grade lumber. At the end of a 50 to 55 year rotation, the value of stumpage on treated stands should not be less than $400 per acre. In some cases it might be profitable to cut and utilize rather than girdle undesirable trees. An operation of this type required the close supervision of one capable of making the proper selection of trees to prune and girdle.

Pruning is an operation that is necessary only in plantations or other pure stands of softwoods. Natural pruning usually results when softwoods are grown in mixture with hardwoods. As a forestry measure the pruning of any except the trees that are expected to make up the final crop is commercially impractical as trees which must necessarily be marketed before the stand matures are not improved enough to justify the cost of pruning.

Girdling

In the Northeast the spruce and northern hardwoods types are an important source of spruce and fir pulpwood. Over much of the region the hardwood species have little or no present value, consequently an increase in the volume of the merchantable softwoods at the expense of the unmerchantable hardwoods increases the value of these mixed stands. In stands contain-

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1 Cline, A. C. and Fletcher, E. D. Pruning for Profit. Mass. Forestry Assn. Bulletin. March 30, 1928.

2 Cline, A. C. and MacAloney, H. J. A Method for Reclaiming Severely Weeviled White Pine Plantations. Mass. Forestry Assn. Bulletin 152, July, 1931.

25 YEARS AFTER HARDWOODS

WERE GIRDLED
1930

HARDWOODS NOT GIRDLED
1930

DEVELOPMENT OF AN UNDERSTORY OF SPRUCE AND FIR IN SIMILAR STANDS WITH AND WITHOUT TREATMENT

CORBIN PARK, NEW HAMPSHIRE

ing merchantable spruce and fir, the girdling of competing hardwoods has proved to be a very profitable cultural measure, - one in which it is possible to realize on the girdling investment in a comparatively short time.

Girdling experiments on the holdings of the Eastern Manufacturing Company, in Maine, indicate the possibilities of such an operation. [1]. On this area the merchantable spruce and fir showed a five-fold increase in the growth rate over an eleven year period following release. At $4 per cord the increase on this particular tract at the end of the period represents an increase in stumpage value of $26.80 per acre. The Finch, Pruyn Company in New York, finds that the average cost of girdling extensive areas is about $2 per acre. Using this figure as a basis for computing costs, it appears quite probable that the added growth put on the first two years following girdling will more than pay the costs of this operation. In stands of this character the stimulating effect of girdling on trees in the smaller size classes is also of considerable importance.

Girdling operations made primarily to benefit immature stands of spruce and fir are financially less attractive than operations which release merchantable material, as it is necessary to wait forty or fifty years before anything can be realized on the girdling investment. This is, however, the type of work which may well be carried out at this time on public forests where the increase in future values is highly desirable. On areas where hardwoods have a potential market value, some of the better trees may profitably remain with the softwood understory to make up the final crop.

At Corbin Park, New Hampshire, girdling experiments in hardwoods stands with an understory of spruce increased the growth rate of the latter from 3 to 6 times. [2] Growth figures to date (25 years after the experiment was initiated) would indicate that at a cost of $2.60 per acre a heavy girdling operation should after 40 years result in a gain of at least 19 cords per acre. Assuming a stumpage value of $4 per cord, this operation will yield excellent returns even as a long term investment. (See Plate II).

Girdling should be undertaken when the trees girdled have little or no market value and the trees benefited a relatively high value. In some cases the stumpage value of wolf trees is outweighed by the damage that would result if an attempt were made to cut and market these trees. Ordinarily girdling should not be undertaken where stands are developing satisfactorily without treatment. Where it is impossible to profitably market large decadent wolf trees, the value of girdling operations is unquestioned. Under these circumstances, trees having little or no potential value should be girdled in order that they may be replaced by more valuable individuals. Only in this way will extensive tracts of badly abused forest land be improved and eventually support stands having some merchantable value.

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1 Westveld, M. Girdling to Release Merchantable Sized Spruce and Fir. Pulpwood, 4:3, 1931.

2 Westveld, M. Results of Experiments on the Release of Immature Spruce by Girdling Hardwoods. (Unpublished).

The various cultural operations will, if properly carried out and under favorable conditions, show a profit. Accessibility and market conditions are practically always the determining factors in considering the financial practicability of any type of forest improvement work. Occasionally the aesthetic may outweigh the financial considerations. It should, however, be understood that these operations all have their limitations, which in most cases have not as yet been clearly defined. Further experimental work will serve to clear up these limitations and demonstrate the practicability of the work under various conditions.

In this report no attempt is made to definitely outline the procedure for any type of work, as every operation presents a different set of conditions. Agencies contemplating work of this character should consult a forester or someone having had considerable experience in forest improvement work, in order to avoid impractical and costly operations. Ordinarily it would be advisable to have the work carried on under the direction of a man with similar qualifications. The various state forestry organizations, the forest schools, and the Northeastern Forest Experiment Station will gladly cooperate in initiating undertakings of this character. The latter organization might well act as a clearing house for information regarding the proper technique, the accomplishments, and the shortcomings of all cultural work undertaken in the region.

There are in the Northeast extensive tracts of land on which the merchantable material has been removed, leaving little or nothing of any immediate value. Rather than carry and pay taxes on these lands, the owners often allow such areas to become tax delinquent and revert to the towns. Steps should be taken by either the states, the counties, or the towns to obtain clear title to these lands. With these lands securely in public ownership, the public would be justified in undertaking planting, girdling, or such cultural measures as would be necessary to eventually restore them from their present deteriorated condition to their former productive state. Such improvement work would build up the economic value of these lands and should prove a highly desirable and profitable public policy.

New Haven, Conn.
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